

Modeling Retirement Income

by William Jahnke

The worm has turned. Not long ago, the conventional practice in retirement planning was to formulate asset allocation solutions and model retirement income based on historical asset class returns. Little or no consideration was given to earnings prospects or valuation levels. Insufficient attention to cost and taxes was common. Recently, a number of thought leaders have challenged one or more aspects of the practice, including Peter Bernstein, William Sharpe, Marty Leibowitz, and Harold Evensky.

Peter Bernstein set the cat among the pigeons in 2003 when he declared the policy portfolio obsolete.¹ Not only did Bernstein disclaim the well-established practice of setting an asset allocation and sticking with it, he blasted the idea of extrapolating historical returns. Bernstein asked, "How certain can we be that trends are destiny?" The way Bernstein sees it, "Trends bend. They often break."

According to Bernstein, even though we don't know the future, we can hedge extreme outcomes that vary with how one perceives risks; there is a big difference between Bernstein's view and throwing up one's hands and proclaiming the future is unknowable, concluding there is nothing we can or should do in the face of changing perceptions of the world around us, or naively believing that the answer to forecasting return distributions lies in extrapolation. One risk that Bernstein has written about extensively is the risk of a U.S. dollar collapse in response to the growing twin deficits. Bernstein makes a number of suggestions about how to hedge dollar risk and its implications for investment returns. While Bernstein calls for "shaking off the constraints of the past," his advice is to be more flexible while sidestepping a prescription for how to actually determine portfolio weightings.

William Sharpe, chief scientist at Financial Engines, is likewise critical of the practice of extrapolating historical returns.² According to Sharpe, "Some consultants look at a historic period and take the average return, which is typically a rotten estimate of expected return. Then they tweak them, and then they round them."

Sharpe attacks the current practice of portfolio formation due to its failure to model the portfolio's asset allocation and cash-flow-generating prospects based on the characteristic of the actual securities or funds held in the portfolio. According to Sharpe, "You need to think about the investment vehicles you use to implement an asset allocation plan....We consider the characteristics of funds by calculating their exposure to the asset groupings, their costs, portfolio turnover, active risk, and past performance....In addition, all of our expected returns are derived from asset pricing theory....And most important we update the market value of our asset classes every month to project our returns." One thing Financial Engines does not do is offer advice on how to weight asset classes; that is something the client provides.

Marty Leibowitz, chief investment officer of TIAA-CREF, following in the footsteps of Bernstein, has called for a more adaptive approach to asset allocation.³ According to Leibowitz, "The policy portfolio has traditionally been thought of as a static entity; that is, once established, it does not change. But recent market moves and investor behavior patterns have called into question the rigidity of the policy portfolio. The potential solution is a more fluid, adaptive policy portfolio that is responsive to discernible changes in the market." Leibowitz, who is a fan of multiple-period cash-flow modeling, does not provide an answer in his article on how to determine asset class weightings for retirement funding. But he is concerned "that people will take computer simulations as being too much of a science....This field is not a science, and it is important to convey the uncertainty of many of the basic assumptions that we have. In all that we do in this field, we must accept a significant and irreducible level of 'model risk.'" On the subject of market timing, Leibowitz is not a fan of playing the market on a daily basis. He observes, "Making moves that respond to discernable changes in the market, which should not happen very often, is something that makes strategic sense."

Harold Evensky, along with Sharpe, is concerned that insufficient attention is being paid to cost and taxes.⁴

Evensky, a winner in the 2002 *Journal of Financial Planning* Call for Papers,⁵ is a proponent of the "core and satellite" portfolio structure that is sensitive to market conditions and takes into careful consideration cost and taxes. According to Evensky, his motivation for advising financial planners to revise their portfolio design along core and satellite lines was the growing consensus among practitioners and academics that investors would be facing an environment of low equity returns during the decade ahead. The core and satellite allocation Evensky proposes assumes that the asset mix allocation decision has already been made and that the core and satellite decision is relegated to being a tax- and cost-efficient selection problem. While he offers some suggestions for how to determine the core and satellite mix, none of them deal with the more general asset allocation decision in terms of the rewards and uncertainty of funding retirement planning goals.

Addressing Three Core Problems

Three core problems need to be addressed in formulating investment solutions designed to fund retirement cash-flow projections:

1. A statement of the investment objective
2. The modeling of multi-period net worth, income, and expenses
3. The estimation of the investment returns

Bernstein, Sharpe, Leibowitz, and Evensky bring attention to one or more of these core problems.

Traditionally, retirement modeling has been strongest in projecting multi-period net worth, income, and expenses. Some of the current criticism cites a failure to model retirement planning solutions at the selection level. This is an important and valid criticism. The criticism follows on Markowitz's observation in 1952 that formulating investment solutions at the asset class level contains "pitfalls." We buy, hold, and sell securities and funds that have unique cost and tax considerations; we do not buy, hold and sell asset classes. The message is that the characteristics of the individual assets we select should influence our asset-class-allocation solution. The asset allocation solution should result from the investment opportunity set that takes cost and taxes explicitly into consideration. One reason for the failure to focus at the selection level in retirement planning is the misguided belief promulgated by the Brinson studies⁶ that security selection is not very important relative to the asset allocation decision in determining investment outcomes. This promoted the separation of the asset allocation and security selection decisions.

One of the typical shortfalls in retirement planning is a failure to adequately consider uncertainty in defining the retirement planning objective. The conventional approach has been to allocate the maximum to equities subject to investor tolerance for short-term portfolio volatility, in the belief that the stock market will outperform the bond and cash markets over retirement planning horizons. The foundation of this belief is that the process that generates asset class returns is stable: stable means, standard deviations, and cross-correlations. This belief is one of the most extreme and unsupported assumptions in financial economics. Without the assumption of a stable return-generating process, not only does "stocks for the long run" lose its guarantee but the nature of managing uncertainty shifts from managing short-term portfolio volatility to managing, as best we can, the uncertainty of funding programmed retirement expenditures and net worth. The investment objective shifts from maximizing stock exposure subject to penalty for short-term portfolio volatility to something akin to maximizing retirement funding subject to a penalty for the uncertainty of underfunding programmed retirement expenses.

Once we abandon the illusion of an orderly risk-and-return investment environment for a wildly unstable investment reality, hedging perceived risks plays a co-existent roll with formulating and exploiting fuzzy return expectations. If we have low confidence in the investment assumptions going into retirement planning models, it is better to present alternative investment tracks in terms of how an investment solution performs in alternative scenarios rather than a single scenario. Scenarios provide the opportunity to address and hedge risks from a

macro-economic perspective rather than the highly statistical but economically oblique perspective of conventional mean-variance portfolio analysis. The projection of investment returns should be based on the modeling of fundamental variables and assumptions regarding the impact of macro-economic drivers of security returns and asset class returns, and an evaluation of pricing anomalies taking into consideration cost and taxes. Given the imprecision in formulating return expectations and the non-normality in cross-sectional and time-series return distributions, acknowledgement and acceptance of the gross approximation in the projection of retirement funding outcomes is preferable to overstating the accuracy in projecting retirement income and the probability of success in funding retirement income goals.

Knowing that future returns can only to a limited extent be "known" by even the most investment savvy should make us all humble when it comes to modeling retirement income. Even with all of its limitations, modeling retirement income is a useful practice. It is best to acknowledge and disclose the limitations with clients, then get on with it as best we can, even though it will never be a science.

Endnotes

1. "Are Policy Portfolios Obsolete?" *Economics and Portfolio Strategy*, March 1, 2003.
2. "Fundamentals," *Bloomberg Wealth Manager*, November 2004: 107–109.
3. "The Changing Role of the Policy Portfolio," *CFA Conference Proceedings, Points of Inflection: New Directions for Portfolio Management*, February 2004: 30–38.
4. "Professional Portfolio Design," *The Investment Think Tank*, Bloomberg Press (2004): 53–72.
5. Harold Evensky, "Changing Equity Premium Implications for Wealth Management Portfolio Design and Implementation," presented at the Financial Planning Association's 2002 Retreat and published in the [June 2002](#) issue of the *Journal of Financial Planning*.
6. Gary P. Brinson, L. Randolph Hood, and Gilbert L. Beebower, "Determinants of Portfolio Performance," *Financial Analysts Journal*, July–August 1986: 39–44; Gary P. Brinson, Brian D. Singer, and Gilbert L. Beebower, "Determinants of Performance II: An Update," *Financial Analysts Journal*, May–June 1991: 40–48.

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